DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/16/07 has been entered.

Note of claimed language:

The term "***used to***", which is performed a functional limitation and not a positive limitation. The term "used to" can be equivalent to the limitation of "adapted to or capable of being."

References:

Sandhu (U.S. Patent 6,084,302)

Funkenbusch et al. (U.S. Patent 5,108,597)

Noorily (U.S. Patent 4,616,102).

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 4-5, 36-38, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu (U.S. Patent 6,084,302) in view of Funkenbusch et al, (U.S. Patent 5,108,597).

As to claims 1-2, Sandhu discloses a printed circuit board (substrate 5, column 3, lines 1-2) as shown in figures 1-3 comprising:

a dielectric board member (10, column 3, line 1); and

first and second signal lines (interconnections 15, column 2, line 67) are adjacent and supported on said dielectric board member (10), said first and second signal lines (15) including first and second elongated electrically conductive member that is enshrouded (**covered or surrounded, see specification page 3, line 9**) by carbon-based claddings (25, column 4, line 33 to column 5, line 5) over ***at least a portion*** of an elongated conductive member length, and a thickness (of the conductive member).

Sandhu does not specific disclose the cladding having a carbon concentration greater than 60% by weight.

Funkenbusch et al. teaches a carbon cladding having a carbon concentration greater than 60% by weight, **see column 6, line 50 through column 7, line 2**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Sandhu in order to provide an excellent shield and a high level resistance in the PCB.

As to claims 36-38, Sandhu discloses a printed circuit board (substrate 5, column 3, lines 1-2) as shown in figures 1-3 comprising:

a dielectric board member (10, column 3, line 1); and

first and second signal lines (interconnections 15, column 2, line 67) are adjacent and supported on said dielectric board member (10), said first and second signal lines (15) including first and second elongated electrically conductive member that is enshrouded (**covered or surrounded, see specification page 3, line 9**) by carbon-based claddings (25, column 4, lines 60-61, column 5, lines 1-5) over ***at least a portion*** of an elongated conductive member length, and a thickness of the conductive member.

Sandhu does not specific disclose each of the claddings having a carbon concentration greater than 60% or approximately of 99% by weight.

Funkenbusch et al. teaches a carbon cladding having a carbon concentration greater than 60% or approximately of 99% by weight, see column 6, line 50 through column 7, line 2.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Sandhu in order to provide an excellent shield and a high level resistance in the PCB.

As to claim 4, Sandhu discloses said carbon-based cladding (25) of said second signal line (15) is discontinuous with said carbon-based cladding of said first signal line, see figure 3.

As to claims 5, 40, Sandhu discloses the PCB as shown in figures 1-3 further comprising a second dielectric board member (30, column 5, lines 25-27) disposed above said first dielectric board member (10) and said first signal line (15).

As to claim 8, Sandhu discloses said carbon-based cladding (25) has a dielectric constant that is greater than a dielectric constant associated with said first dielectric board member because the carbon based cladding having carbon and metal which is less resistive, and a dielectric board has a rigid resistance made of dielectric oxide.

3. Claims 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noorily (in the record) in view of Funkenbusch et al, (U.S. Patent 5,108,597).

As to claims 30-32, 34-35, Noorily discloses a carbon-based cladding structure as shown in figure 1 comprising:

a carbon-based cover (32, column 3, lines 23-24); and

a rigid dielectric board member (20, column 3, line 12) having a plurality of conductor elements (26,28,30), at least one of said plurality of conductor elements, which are signal lines fully covered over top, bottom, and side portions thereof with said carbon-based cover (32), see figure 1, said cover of one of the conductive element is connected to another cover of another of the conductive elements, and a second dielectric member (14) located above the cover (32), and a thickness.

Noorily does not specific disclose the cladding having a carbon concentration greater than 60% or approximate of 99% by weight.

Funkenbusch et al. teaches a carbon cladding having a carbon concentration greater than 99% by weight, **see column 6, line 50 through column 7, line 2**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Funkenbusch et al. employed in the PCB of Noorily in order to provide an excellent shield and a high level resistance in the PCB.

Regarding claim 33, Noority discloses said carbon-based cover has a dielectric constant that is greater than a dielectric constant associated with said dielectric board member.

4. Claims 3, 6-7, 39, 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sandhu in view of Funkensusch as applied to claims 1-2, 4-5, and 8 above, and further in view of Noorily.

Sandhu and Funkenbusch disclose all of the limitations of the claimed invention, except for the cladding of the first signal line being continuous with the cladding of the second signal line and each of the claddings being covered greater than 90% of the surface of the first or second signal line (top, bottom, and sides).

Noorily teaches a carbon cladding (32) fully covered to each of signal lines (26, 28, and 30-figure 1).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching of Noorily employed in the PCB of Sandhu and Funkenbusch in order to provide a fully support, an excellent shield, and a high level resistance to the signal line in the PCB.

Response to Arguments

5. Applicant's arguments with respect to claims 1-8, and 30-41 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues:

a) Funkenbusch fails to disclose the carbon cladding having a concentration greater than 60% or approximately to 99% by weight.

Examiner disagrees. Sandhu as modified of Funkenbusch that Funkenbusch specific shows a carbon cladding having a carbon concentration greater than 60% or approximately of 99% by weight, **see column 6, line 50 through column 7, line 2**.

Thus, Funkenbusch describes a carbon support material having a concentration of at lease 60% by weight of Funkenbusch in the carbon cladding structure of Sandhu in order to provide an excellent shield and a high level resistance in the PCB. Therefore, Sandhu in view of Funkenbusch is proper in combination in order to reject the claimed invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T. Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Reichard Dean can be reached on 571-272-1984. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tuan T Dinh/
Primary Examiner, Art Unit 2841.